

removing the pulp from the top of the bleach tower after the pulp reacts with the peroxide in the bleach tower.

44. A method as recited in claim 36 wherein step (g) is practiced in two stages using peroxide, the first stage in sequence using a peroxide dosage of between 5 to just below 10 kg/adt and with about 5-15 kg/adt oxygen, and the second peroxide stage in sequence having a dosage of 10-20 kg/adt peroxide and an oxygen dosage of 0-10 kg/adt.

45. A method as recited in claim 36 wherein step (e) is practiced by using 5-30 kg/adt chlorine dioxide calculated as active chlorine.

46. A method as recited in claim 36 wherein steps (a) through (g) are practiced as part of a treatment sequence of the pulp, in which the steps are practiced to bleach the pulp to an ISO brightness of over 80, comprising Cooking - 0- AD - P, or Cooking 0 - ADQ - P.--

REMARKS

By the present amendment claim 16 has been amended to specifically call for bleaching with hydrogen peroxide, but it otherwise remains substantively unchanged. A new set of claims 36 through 46 are provided which call for bleaching with hydrogen peroxide, and also call for, in step (e), treating the pulp with chlorine dioxide and adding chemicals to the pulp to adjust the metal profile thereof prior to or in combination with the chlorine dioxide treatment.

Reconsideration is respectfully requested of the rejection of claims 16 through 34 on page 2 of the Action. None of claims 16 through 34 as they originally existed are obvious over the WO 94/20674 reference (hereinafter "Devenyns") in view of EP 0622491 (hereinafter "EP '491"). Nor is the rejection applicable to present claims 16 through 19, 21, 22, 24 through 30, and 32-34.

The invention relates to a method of pretreating cellulose pulp prior to bleaching with peroxide in order to improve the bleachability of the pulp. It has been found according to the present invention that if the pulp is treated in a treatment stage where the kappa number of the pulp is lowered under acidic and hot conditions, with the pH properly adjusted, and thereafter the pulp is chelated, the bleachability of the pulp is optimized with respect to both metals and the kappa number, prior to actual treatment in the peroxide stage. In a second treatment stage tower, after the acid tower, the pulp may be treated with chlorine dioxide which cost-effectively enhances the bleachability of the pulp.

That is according to the invention as recited in claim 16, if necessary cellulose pulp has the pH thereof adjusted to between 2-6 by adding an acid that does not contain oxidizing perhydroxyl ions, the pulp is fed to an acid tower, and the pulp is treated in the acid tower at substantially the same pH (between 2-6) to which it has been adjusted, at a pressure of 0-20 bar, at a temperature of 75-130°C, and for 20 to 240 minutes (e.g. a temperature 80-110°C, at a pH of between about 3-4, for a time of 30-180 minutes), so as to decrease the kappa number by one to nine units, typically at

least two units. Then the pulp is transferred from the acid tower to a tower of a second treatment stage, in which chelation occurs, that is treatment with a complexing agent at a pH of between 4-9. Then the pulp is washed, pressed, or both, and then bleached with hydroxide peroxide using 5-20 kg peroxide per air dried ton of pulp, and 0-15 kg oxygen per air dried ton of pulp.

It is respectfully submitted that neither the Devenyns nor the EP '491 references teach the claimed invention even if the references are combined.

Since no English language translation of the Devenyns reference was provided, yet portions thereof which ostensibly show various features are quoted in the previous Action, applicant has had made an English language translation of what applicant believes are the relevant portions of Devenyns, and applicant also provides herewith a Derwent abstract translation, these documents being combined in the enclosed document entitled "Devenyns Translation".

In the previous Action it is alleged that Devenyns teaches a bleaching sequence in which a Q stage is preceded by an A-washing stage. However the undersigned can find no place in Devenyns, or in the enclosed translation, where there is any discussion of such a sequence. All that Devenyns suggests, as far as the undersigned can tell, is that metal removal is done either by chelating (a Q stage) or using an acid stage (see page 5). Devenyns also teaches that a substantial amount of acid may be added to the chelating stage. However this has nothing to do with the invention as recited in claim

16 where acid treatment is done for lowering the kappa number, and then in a subsequent stage chelation is practiced for metals removal.

Devenyns relates to a pulp bleaching method comprising series of chlorine-free stages. According to page 2, lines 8-26, the object of the invention is to remedy the drawbacks of known processes by providing a method which achieves efficient delignification of unbleached chemical pulp, which allows obtaining pulps having high intrinsic qualities without the need to use chlorine reactants.

To that end, the Devenyns invention relates to a chemical paper pulp delignification method using a sequence of chlorine-free stages according to which a reactant chosen from oxygen, metal ion sequestering agents, and hydrogen peroxide is applied, characterized in that the sequence comprises the following successive stages:

O-Q-P-A

wherein

O refers to a treatment stage with oxygen,

Q refers to a stage in which the pulp is decontaminated from its metal ions,

P refers to a treatment stage with alkaline hydrogen peroxide, and

A refers to a treatment stage with peroxycid.

The independent claim of the Devenyns patent, i.e. claim 1, corresponds to the above definition of the Devenyns invention.

Thus it appears clear that not only does Devenyns not teach steps (c) and (e) of claim 16, let alone in a sequence of steps (c), then (e), and then (g) as set forth in claim 16, but rather Devenyns provides a teaching specifically contrary to the invention.

The EP '491 reference does not remedy the deficiencies of Devenyns as far as teaching the claimed invention is concerned, and in fact also teaches away from the present invention. EP '491 relates to a method of bleaching pulp in which the pulp is first treated with acid, desirably together with complexing agents; see page 2, lines 49-50, page 3, lines 10-11 and 21-24, and page 4, lines 33-35.

The acid treatment of EP '491 is directed merely to the removal of metal ions as clearly stated on page 4, lines 47 to 50 where even an additional acid treatment stage has been suggested but merely for obtaining a particularly low content of transition metals. If a delignifying effect is desired, the acid treatment is suggested to be performed in the presence of a delignifying chemical (page 4, lines 51 to 56). In general, EP '491 gives the impression that delignification is equal to the reduction of kappa number, and vice versa. In other words, EP '491 does not recognize the possibility of decreasing the kappa number of pulp with a mere acid stage, but rather requires that a delignifying chemical must be used if such an effect is desired.

In reviewing the process parameters given in EP '491 it is seen that the preferable ranges for temperature and residence time are 40 to 80°C and 10 min. to 60 min. What this means is that the authors of EP '491 felt that the preferable reaction parameters were the best for their purposes. And since their purpose is to remove

transition metals they are undoubtedly correct. But there is a difference between the removal of transition metals and the decrease of kappa number in an acid stage. In the claimed invention (i.e. for decreasing the kappa number in an acid stage) one requires either significantly longer residence time or significantly higher temperature. For instance, the instant application specification gives an example where the residence time is 3 hours (180 minutes) and the temperature 100°C. In other words, both parameters are out of the preferred range of the ones given in EP '491. In other words, the teachings of EP '491 do not lead a single reader to perform experiments which would result in a decrease in kappa number. That is the EP '491 reference clearly does not teach treating the pulp in an acid tower so as to decrease the kappa number by 1-9 units, or at least two units, as recited in claims 16 and 17, respectively.

Thus, even if Devenyns and EP '491 are combined, there is absolutely no suggestion for the specific steps (c) and (e) of claim 16, let alone in the sequence recited and including step (g). However if the references in combination did teach all of the features of claim 16 (which they do not), there still clearly and unequivocally is no *prima facie* case of obviousness.

To have a *prima facie* case of obviousness, the references in and of themselves must teach the claimed invention. In this regard see *In re Rouffet*, 149 F.3d 1350, 47 USPQ 2d 1453, 55-9 (Fed. Cir. 1998):

"To reject claims in an application under section 103, an examiner must show an unrebutted *prima facie* case of obviousness. See *In re Deuel*, 51 F.3d 1552, 1557, 34 USPQ2d 1210, 1214 (Fed. Cir. 1995). In the absence of a proper *prima facie* case of obviousness, an applicant who complies with the

other statutory requirements is entitled to a patent. See *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). On appeal to the Board, an applicant can overcome a rejection by showing insufficient evidence of *prima facie* obviousness or by rebutting the *prima facie* case with evidence of secondary indicia of nonobviousness. See *id.*

When a rejection depends on a combination of prior art references, there must be some teaching, suggestion, or motivation to combine the references. See *In re Geiger*, 815 F.2d 686, 688, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987). Although the suggestion to combine references may flow from the nature of the problem, see *Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1630 (Fed. Cir. 1996), the suggestion more often comes from the teachings of the pertinent references, see *In re Sernaker*, 702 F.2d 989, 994, 217 USPQ 1, 5 (Fed. Cir. 1983), or from the ordinary knowledge of those skilled in the art that certain references are of special importance in a particular field, see *Pro-Mold*, 75 F.3d at 1573 (citing *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 297 n.24, 227 USPQ 657, 667 n.24 (Fed. Cir. 1985)). Therefore, "[w]hen determining the patentability of a claimed invention which combines two known elements, 'the question is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination.'" See *In re Beattie*, 974 F.2d 1309, 1311-12, 24 USPQ2d 1040, 1042 (Fed. Cir. 1992) (quoting *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed. Cir. 1984)). ...

As this court has stated, "virtually all [inventions] are combinations of old elements." *Environmental Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 698, 218 USPQ 865, 870 (Fed. Cir. 1983); see also *Richdel, Inc. v. Sunspool Corp.*, 714 F.2d 1573, 1579-80, 219 USPQ 8, 12 (Fed. Cir. 1983) ("Most, if not all, inventions are combinations and mostly of old elements."). Therefore an examiner may often find every element of a claimed invention in the prior art. If identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue. Furthermore, rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention. Such an approach would be "an illogical and inappropriate process by which to determine patentability." *Sensonics, Inc. v. Aerosonic Corp.*, 81 F.3d 1566, 1570, 38 USPQ2d 1551, 1554 (Fed. Cir. 1996).

To prevent the use of hindsight based on the invention to defeat patentability of the invention, this court requires the examiner to show a

motivation to combine the references that create the case of obviousness. In other words, the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed.

This court has identified three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art. In this case, the Board relied upon none of these. ...

Because the Board did not explain the specific understanding or principle within the knowledge of a skilled artisan that would motivate one with no knowledge of Rouffet's invention to make the combination, this court infers that the examiner selected these references with the assistance of hindsight. This court forbids the use of hindsight in the selection of references that comprise the case of obviousness. See *In re Gorman*, 933 F.2d 982, 986, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991). Lacking a motivation to combine references, the Board did not show a proper prima facie case of obviousness. This court reverses the rejection over the combination of King, Rosen, and Ruddy."

Here there is nothing about the nature of the problem solved, the teachings of the prior art, or the knowledge of persons of ordinary skill in the art, that would suggest the combination of Devenyns with EP '491 made in the previous Action. Rather the claimed invention is in fact specifically contrary to those references since EP '491 teaches that a delignifying chemical must be used with acid in order to decrease the kappa number, and Devenyns teaches an entirely different sequence than that provided according to the invention. To modify either Devenyns or EP '491 to provide the invention, one would have to go specifically against the teachings of those references, for which there is no suggestion in the prior art -- rather the combination would have to be based solely on hindsight. This is inappropriate as made clear by *In re Rouffet*,

supra. Also in this regard see *In re Mercier*, 185 USPQ 774, 778 (CCPA 1975) wherein the Court held:

"The relevant portions of a reference include not only those teachings which would suggest particular aspects of an invention to one having ordinary skill in the art, but also those teachings which would lead such a person away from the claimed invention. See *In re Lunsford*, 53 CCPA 986, 357 F.2d 380, 148 USPQ 716 (1966). ... Without the benefit of appellant's disclosure, a person having ordinary skill in the art would not know what portions of the disclosure of the reference to consider and what portions to disregard as irrelevant, or misleading. See *In re Wesslau*, 53 CCPA 746, 353 F.2d 238, 147 USPQ 391 (1965)." [Emphasis added]

Thus independent claim 16 clearly patentably distinguishes from the art.

Reconsideration is also respectfully requested of the rejection of the claims dependent upon claim 16, namely 17 through 19, 21, 22, and 24 through 34. The previous Action nowhere mentions any of these claims or the specific features set forth in these claims. Nor does the undersigned see in the references the particular conditions for step (c) set forth in claim 17, let alone in combination with the particular conditions set forth in claim 18 for step (e), the use of chlorine dioxide in the practice of step (e) as set forth in claim 19, the particular additional step in claim 22, utilizing a fractionating washer etc. as set forth in claim 24, utilizing the two towers set forth in claim 25, utilizing the particular conditions for the peroxide treatment set forth in claim 26, the addition of the particular amount of chlorine dioxide in step (e) as recited in claim 33, or the particular sequence set forth in claim 34. Therefore all of the claims clearly patentably distinguish from the art.

New claims 36 through 46 also clearly patentably distinguish from the art for the same reasons set forth above with respect to claim 16, and also because there clearly and unequivocally is no teaching in the references of step (e) of claim 36 in which chlorine dioxide is used to effect treatment. Nor are the features of any of the claims dependent upon claim 36 taught by the references even if combined.

Reconsideration is also respectfully requested of the rejection of claim 35 on page 3 of the Action adding the JP 57-21591 and Walsh references. Neither the JP or Walsh references in any way remedy the deficiencies of the primary references as far as teaching the claimed invention is concerned therefore even if the references are combined the claimed invention does not ensue. Further, there simply is no *prima facie* case of obviousness; that is there is no motivation why one of ordinary skill in the art would combine the teachings of the references in order to provide the claimed invention. Nor do either the JP or Walsh references teach the particular sequence recited in claim 35. The mere fact that part of the sequence set forth in claim 35 might be shown in the Japanese reference or Walsh provides absolutely no reason why the complete sequence recited in claim 35 would be used, nor any reason why one of ordinary skill in the art would modify the primary references to provide the same, especially since it appears contrary to the primary references to do that.

In conclusion, all of the claims are clearly patentably distinct from the prior art therefore early passage of the subject application to issue is earnestly solicited.

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Should any small matters remain outstanding it is requested that the undersigned attorney be given a call so that such matters may be worked out and the application placed in condition for allowance without the necessity of another Action and amendment.

Respectfully submitted,

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